

GRAPHITE (NATURAL)

(Data in thousand metric tons, unless otherwise noted)

Domestic Production and Use: Natural graphite was not produced domestically in 1998. Natural graphite was consumed by approximately 200 manufacturing firms, primarily in the Northeastern and Great Lakes regions. The major uses of natural graphite did not significantly vary from those of 1997. Refractory applications, once again, led the way in use categories with 33%; brake linings was second with 19%; lubricants, 6%; dressings and molds in foundry operations, 4%; and miscellaneous uses making up the remaining 38%.

Salient Statistics—United States:	1994	1995	1996	1997	1998^e
Production, mine	—	—	—	—	—
Imports for consumption	53	61	53	58	66
Exports	20	37	26	40	37
Consumption, apparent	33	24	27	18	29
Price, imports (average dollars per ton at foreign ports):					
Flake	629	658	699	622	700
Lump and chip (Sri Lanka)	709	610	675	1,010	1,000
Amorphous (Mexican)	138	143	134	153	150
Stocks, yearend	NA	NA	NA	NA	NA
Net import reliance ¹ as a percent of apparent consumption	100	100	100	100	100

Recycling: Refractory brick and linings, as usual, led the way in recycling of graphite products. Primary recycling of refractory articles is growing with the recycled market being principally in less demanding service conditions, such as safety linings and thermal insulation.

Import Sources (1994-97): Mexico, 28%; Canada, 27%, China, 27%; Madagascar, 8%; and other, 10%.

Tariff:	Item	Number	Normal Trade Relations (NTR) 12/31/98	Non-NTR² 12/31/98
	Crystalline flake (not including flake dust)	2504.10.1000	Free	3.6¢/kg.
	Other	2504.90.0000	Free	10% ad val.

Depletion Allowance: 22% (Domestic lump and amorphous), 14% (Domestic flake), 14% (Foreign).

Government Stockpile:

Stockpile Status—9-30-98³

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 1998	Disposals FY 1998
Sri Lanka, amorphous lump	5	—	—	—	—
Madagascar, crystalline flake	10	2	10	2	2
Other than Sri Lanka and Madagascar crystalline	(4)	—	(4)	—	—

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Events, Trends, and Issues: Graphite was near to supply-demand balance in 1998. Demand was met largely by imports of flake from Canada, China, and Madagascar; lump and chip from Sri Lanka; and amorphous graphite from China and Mexico. Graphite electrode consumption in steelmaking has been decreasing since the late 1980's because of increased efficiency by the iron and steel producers. Use of natural graphite in lubrication applications is also decreasing because of changes in requirements for lubricant compositions and in processing technologies.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ⁵	Reserve base ⁵
	1997	1998 ^e		
United States	—	—	—	1,000
Brazil	36	40	460	1,000
China	190	200	5,300	310,000
India	120	120	620	620
Madagascar	16	15	960	960
Mexico	42	40	3,100	3,100
Other countries	171	190	5,300	43,800
World total (may be rounded)	575	605	16,000	360,000

World Resources: Domestic resources are relatively small, although the rest of the world's inferred reserve base exceeds 800 million tons of recoverable graphite.

Substitutes: Manufactured graphite powder, scrap from discarded machined shapes, and calcined petroleum coke compete for use in iron and steel production. Finely ground coke with olivine is a potential competitor in foundry facing operations. Molybdenum disulfide competes as a dry lubricant, but is more sensitive to oxidizing conditions.

^eEstimated. NA Not available.

¹Defined as imports - exports + adjustments for Government and industry stock changes. Data on changes in stocks were not available and were assumed to be zero in the calculations.

²See Appendix B.

³See Appendix C for definitions.

⁴Less than ½ unit.

⁵See Appendix D for definitions.